SNA LAB EXPERIMENT 5

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Div: 1

Batch: S4

Subject: SA(Sensors and Automation)

Part A:Study hardware and software used in PLC

Part B:Implementation of Logic gates

Part A:

Aim:To study hardware and software associated with PLC

Objectives:

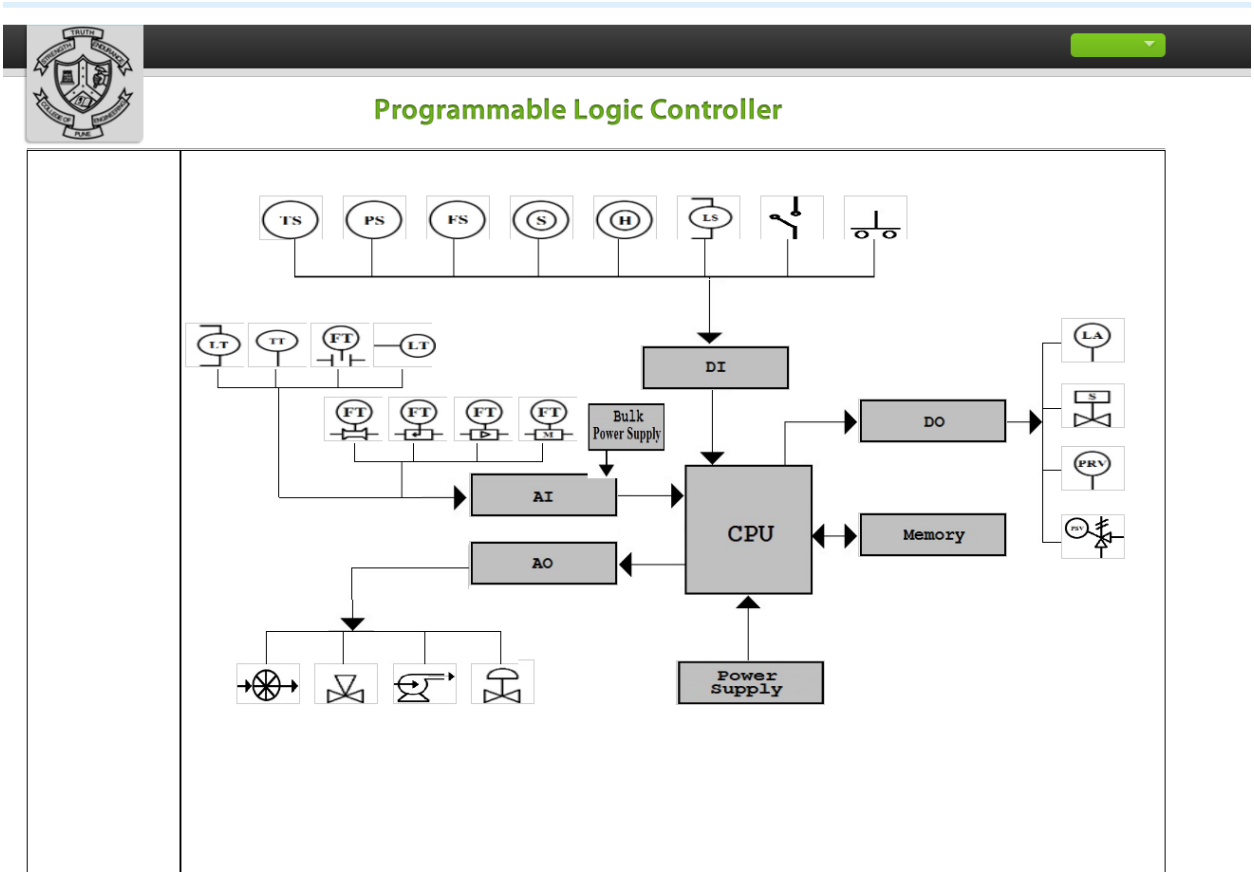
1. Learn the basics and hardware components of PLC
2. Understand configuration of PLC system
3. Study various building blocks of PLC

Theory:

A Programmable Logic Controller , PLC, or Programmable Controller is an electronic device used for Automation of industrial processes, such as control of machinery on factory assembly lines. A programmable controller is a digitally

operating electronic apparatus which uses a programmable memory for the internal storage of instructions for implementing specific functions, such as logic, sequencing, timing, counting and arithmetic, to control various machines or processes through digital or analog input/output devices. Unlike general purpose computers, the PLC is designed for multiple inputs and output arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibrations and impacts.

Programs to control machine operation are typically stored in battery-backed or non volatile memory. A PLC is an example of a real time system since output results are produced in response to input conditions within a bounded time, otherwise unintended operation results.



Conclusion:

1. Consequently, we delved into the fundamentals and hardware elements of PLCs, comprehending their workings.
2. We grasped the fundamental operations of PLC hardware components, closely observing their functions.
3. The workings of a PLC system were thoroughly examined, allowing for a deeper understanding.
4. We gained insight into the setup and configuration of PLC systems, comprehending their configurations.
5. Exploring diverse components, we examined the foundational building blocks of PLCs.

Part B:

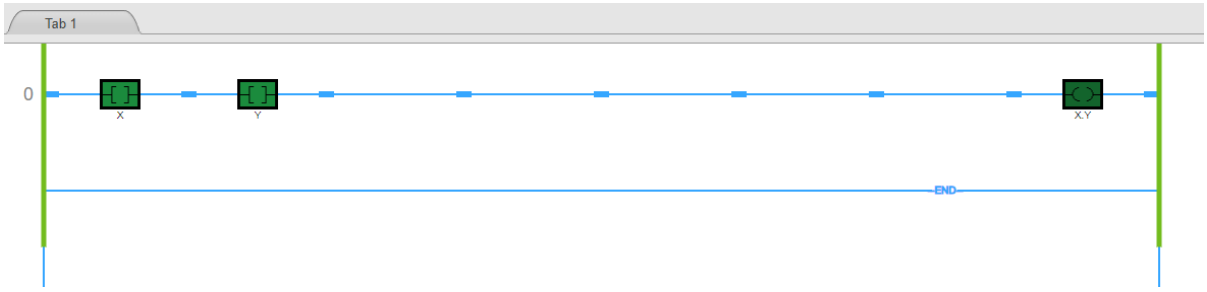
Aim:To understand Simple Ladder program.

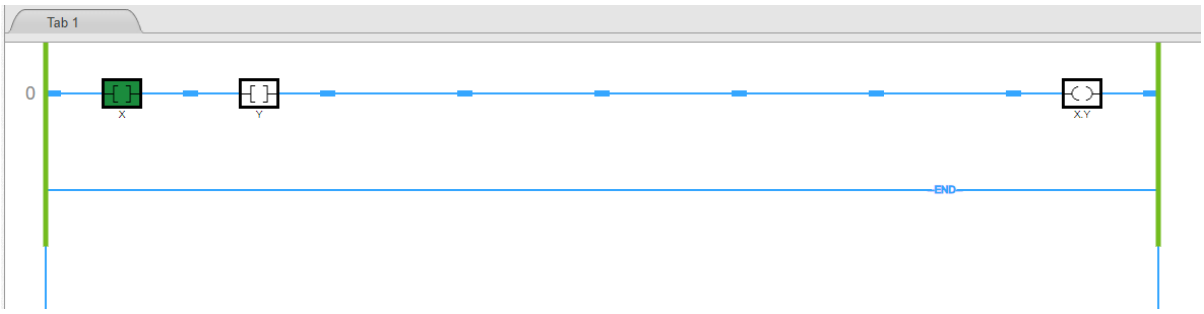
Objectives:

1. Develop a ladder using standard procedure.
2. Solve the problem using ladder programming.

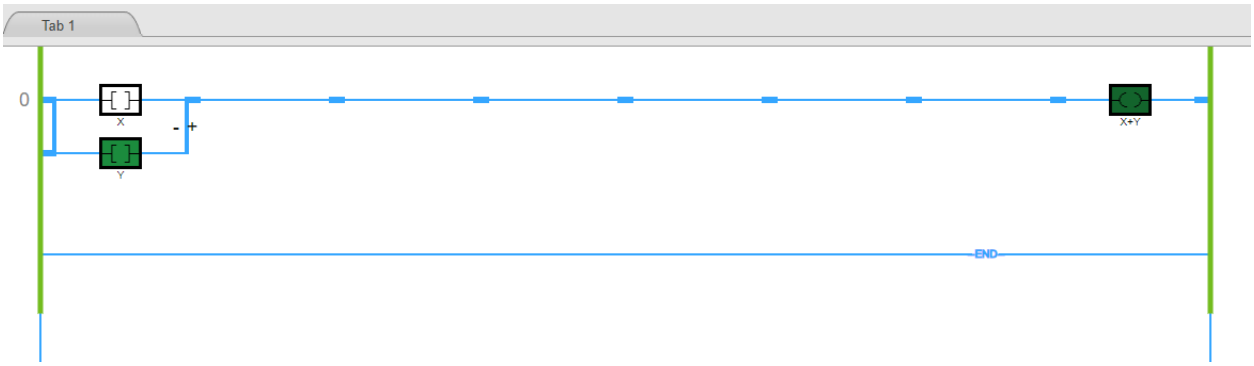
Diagrams:

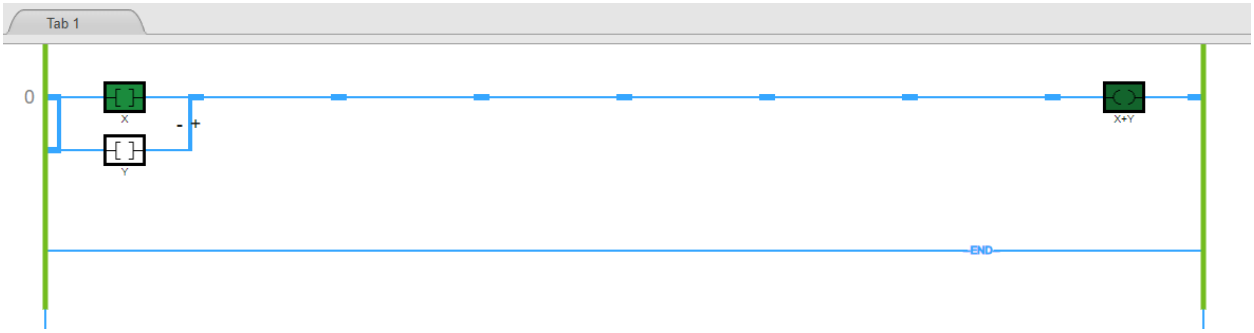
1)Implementation of AND gate using Ladder Logic is as Follows:



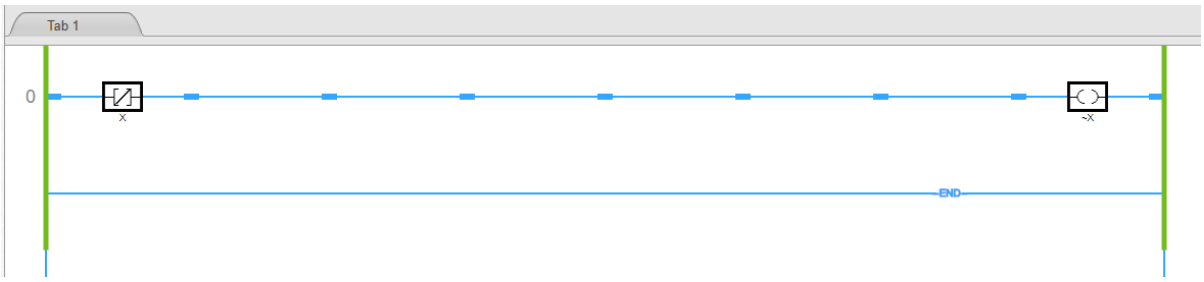


2)Implementation of OR gate using Ladder Logic is as Follows:

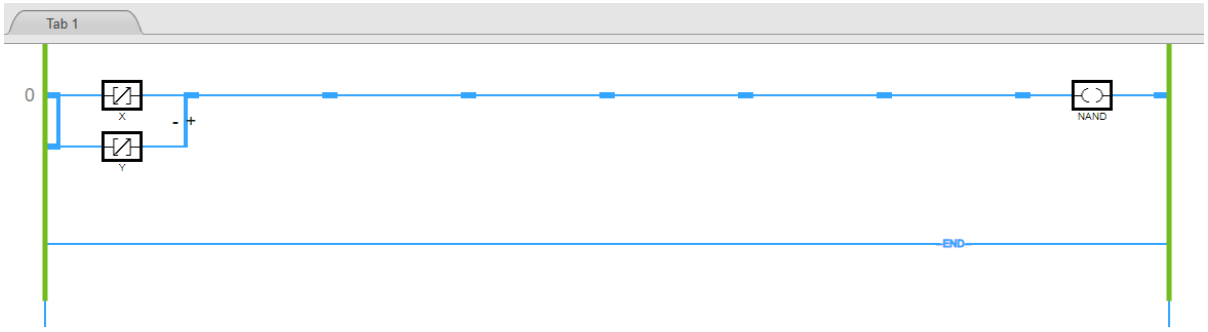




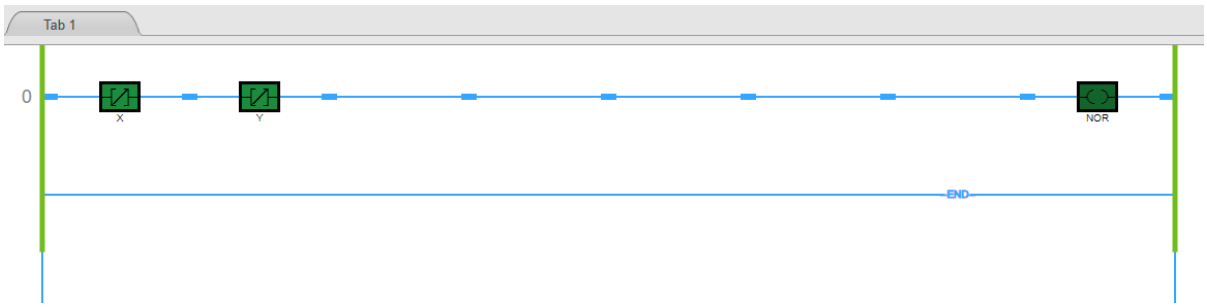
3)Implementation of NOT gate using Ladder Logic is as Follows:

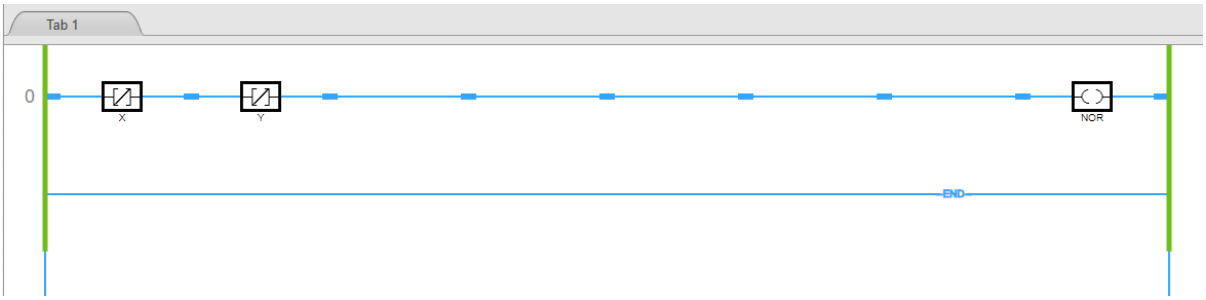


4)Implementation of NAND gate using Ladder Logic is as Follows:



5)Implementation of NOR gate using Ladder Logic is as Follows:





Conclusion:

1. We delved into the intricacies of ladder programming, comprehending its principles and mechanisms.
2. Through ladder programming, we successfully applied various logic gates, showcasing their functionality.
3. The validity of truth tables corresponding to different logic gates was confirmed through ladder programming.
4. We gained a comprehensive understanding of the utilization of ladder programming within PLC systems.